Assessment Schedule – 2010

Statistics and Modelling: Solve straightforward problems involving probability (90643)

Evidence Statement

Q	Evidence	Code	Judgment	Sufficiency
ONE (a)	$E(H) = 1\frac{1}{5} = 1.2$ $VAR(H) = \frac{18}{25} = 0.72$	a	Or equivalent. CRO.	Achievement: 1 a
(b)	E(winnings) = \$3.00 plus at least 60c profit The Game price should be \$4.00 (nearest dollar).	m	No alternative. CRO.	Merit: 1 m
(c)	T = 5A + 4B E(T) = \$262.30 VAR(T) = \$1 457.44 S.D.(T) = \$38.18	e	Or equivalent. Needs justifying.	Excellence: 1 e
TWO (a)	P(spectator keeps track of ball) = 0.55 × 0.4 + 0.45 × 0.7 = 0.535	a	Or equivalent. CRO.	Achievement: 1 a
(b)	P(box is rejected) $= \frac{\left({}^{3}C_{2}\right)\bullet\left({}^{9}C_{2}\right)+\left({}^{3}C_{3}\right)\bullet\left({}^{9}C_{1}\right)}{\left({}^{12}C_{4}\right)}$	m	Or equivalent. CRO.	Merit: 1 m
(c)	$= \frac{13}{55} = 0.2364$ Must get to 3 points all, then Ani wins next two. That is Ani wins 5 points and looses 3 points. P(Ani wins after 8 more points) $= 8\ (0.6)^5(0.4)^3$ = 0.03981312 = 0.040 (to 2 s.f.)	e	Or equivalent. Needs justifying.	Excellence: 1 e

Q	Evidence	Code	Judgment	Sufficiency
THREE (a)	$P(U) = \frac{70}{150} = \frac{7}{15} = 0.467 \quad P(V) = \frac{114}{150} = \frac{19}{25} = 0.76$ $P(U) \times P(V) = \frac{133}{375} = 0.3547$ $P(U \cap V) = \frac{42}{150} = \frac{7}{25} = 0.28$ $P(U) \times P(V) \neq P(U \cap V)$ therefore the events U and V are not independent.	a	Must have numeric proof and a similar statement.	Achievement: 1a
(b)	$P(U \mid V) = \frac{\frac{42}{150}}{\frac{114}{150}} = \frac{42}{114} = \frac{7}{19} = 0.3684$	m	Or equivalent. CRO.	Merit: 1m
(c)	$P(\text{peas} \mid \text{tomatoes}) = \frac{P(\text{peas} \cap \text{tomatoes})}{P(\text{tomatoes})}$ $= \frac{\frac{27}{70}}{\frac{47}{70}} = \frac{27}{47} = 0.5745$	e	Or equivalent. Needs justifying.	Excellence: 1 e

Judgement Statement

Achievement	Achievement with Merit	Achievement with Excellence
Solve straightforward problems involving probability	Solve probability problems	Apply probability theory
2 **A**	2 **M**	2 **E**

The following Mathematics-specific marking conventions may also have been used when marking this paper:

- Errors are circled.
- Omissions are indicated by a caret (∧).
- **NS** may have been used when there was not sufficient evidence to award a grade.
- **CON** may have been used to indicate 'consistency' where an answer is obtained using a prior, but incorrect answer and **NC** if the answer is not consistent with wrong working.
- **CAO** is used when the 'correct answer only' is given and the assessment schedule indicates that more evidence was required.
- **#** may have been used when a correct answer is obtained but then further (unnecessary) working results in an incorrect final answer being offered.
- **RAWW** indicates 'right answer, wrong working'.
- **R** for 'rounding error' and **PR** for 'premature rounding' resulting in a significant round-off error in the answer (if the question required evidence for rounding).
- **U** for incorrect or omitted units (if the question required evidence for units).
- **MEI** may have been used to indicate where a minor error has been made and ignored.